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GUIDELINES

for Chilling, Freezing, Shipping and Packaging Meat Carcasses and Meat Byproducts

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GUIDELINES *for Chilling, Freezing, Shipping and Packaging Meat Carcasses and Meat Byproducts*

preface...

A primary objective of the Meat and Poultry Inspection Program of the U.S. Department of Agriculture is to assure the production and distribution of wholesome meat and meat byproducts. It is to the advantage of all concerned—producer, processor, inspector, and consumer—that meat and meat byproducts be handled in a manner conducive to the production and maintenance of product wholesomeness.

Recommendations in this handbook were developed after an extensive study, analysis, and evaluation of industry methods and practices for handling meat and meat byproducts.

During the course of preparation, storage, shipping, and distribution, spoilage of meat and meat byproducts may result if such products are improperly handled. Observance of the procedures outlined in

this guideline will reduce the possibility of product becoming unsound during transit to domestic and foreign markets.

Meat industry receivers, U.S. armed forces, and meat industry carriers and others have expressed great concern about the “off condition” and contamination of meat carcasses during transit. The economic losses caused by such problems can be measured in millions of dollars annually.

USDA meat inspection specialists have studied the problem and have sought assistance from all sources to solve it. USDA has actively participated with industry groups that also seek a solution. Sufficient research has been conducted by various private and governmental agencies to lay a solid foundation for the problem solution.

The guidelines presented in this handbook will not solve all problems. They will, if followed, be a great step in the right direction.

GUIDELINES for MEAT and MEAT BYPRODUCTS

Chilling

1. PLACE MEAT BYPRODUCTS UNDER EFFECTIVE REFRIGERATION WITHIN ONE AND A HALF HOURS AFTER EVISCERATION. REMOVE BYPRODUCTS ON RACKS, TREES, HOOKS, OR SIMILAR DEVICES FROM THE SLAUGHTERING DEPARTMENT AND REFRIGERATE THEM DURING EMPLOYEE RELIEF BREAKS AND LUNCH PERIODS.

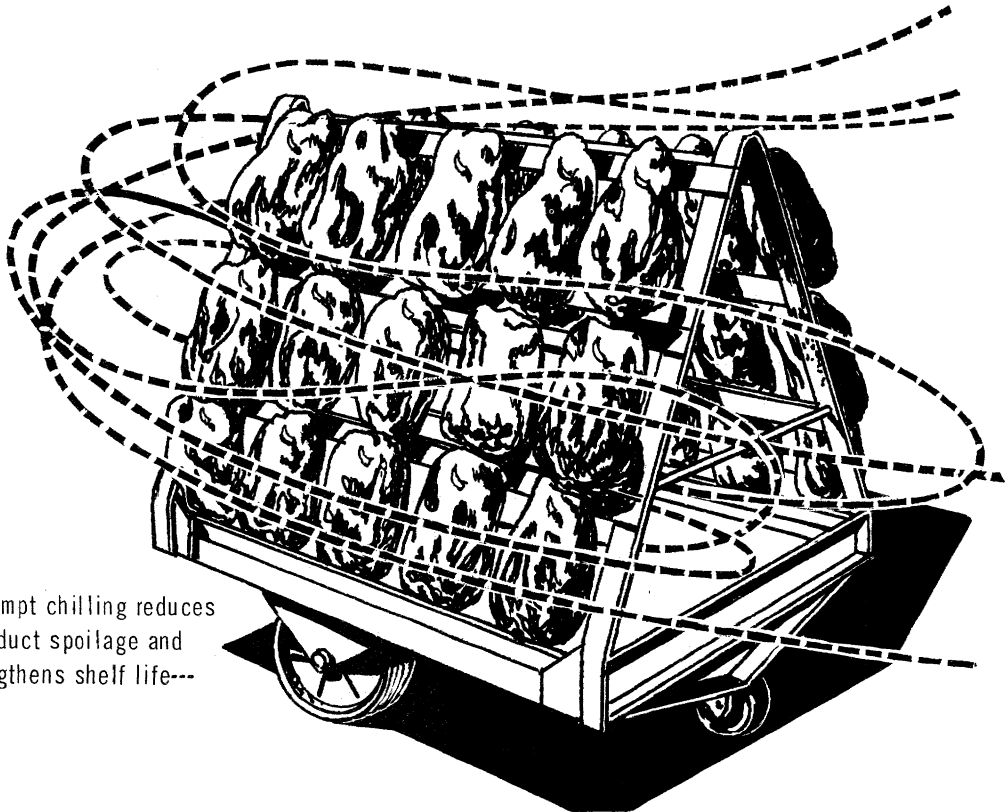
Meat and meat byproducts develop high putrefactive bacterial counts if not refrigerated within a reasonable time. These bacteria cause spoilage and shorten product shelf life. Livers, spleens, and hearts are blood-containing organs, and blood is a natural medium for bacterial

growth. Chilling inhibits this bacterial growth. Exposure of products to the high temperatures and high humidity in slaughtering departments, for extended periods, increases the chance of product spoilage.

2. DRAIN WASHED MEAT OR MEAT BYPRODUCTS BEFORE PACKAGING TO REMOVE EXCESS WATER.

Improper drainage can result in greater bacterial growth, net weight label violation, a moisture violation if the meat byproduct is used in comminuted product, or other adulteration or misbranding contrary to inspection regulations. Draining procedures should result in a finished product with only the minimum amount of added water consistent with good commercial practices.

Prompt chilling reduces product spoilage and lengthens shelf life---



3. KEEP TEMPERATURES IN MEAT OR MEAT BYPRODUCT CHILL COOLERS BELOW 36° F.

A chill cooler temperature of 36° F. or less is necessary to reduce internal temperatures of warm products to 40° F. within a 16-hour period.

4. REDUCE INTERNAL TEMPERATURES OF MEAT OR MEAT BYPRODUCTS TO 40° F. WITHIN 16 HOURS AFTER SLAUGHTER OR EVISCERATION, WHETHER SUCH PRODUCTS ARE IN A CHILL COOLER OR A FREEZER.

Meat or meat byproducts that are chilled to this extent are less likely to spoil when shipped as chilled product. Also, products reduced to 40° F. or lower by chilling are easily reduced to the frozen state when placed in an adequately performing freezer.

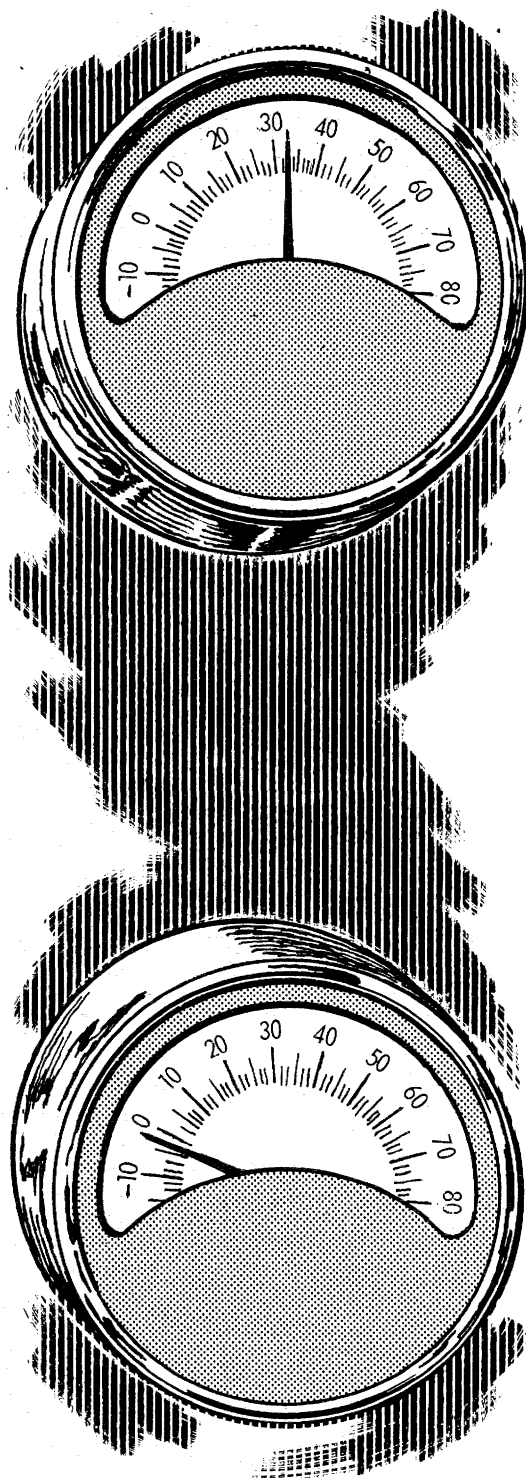
Proper chilling of "hot pack" byproducts will reduce the possibility of product spoilage. The in-box temperature of such product is usually very near the live animal body temperature. Consequently, it is more difficult to adequately lower product temperature within all areas of the boxed product than it is for "prechilled" boxed product.

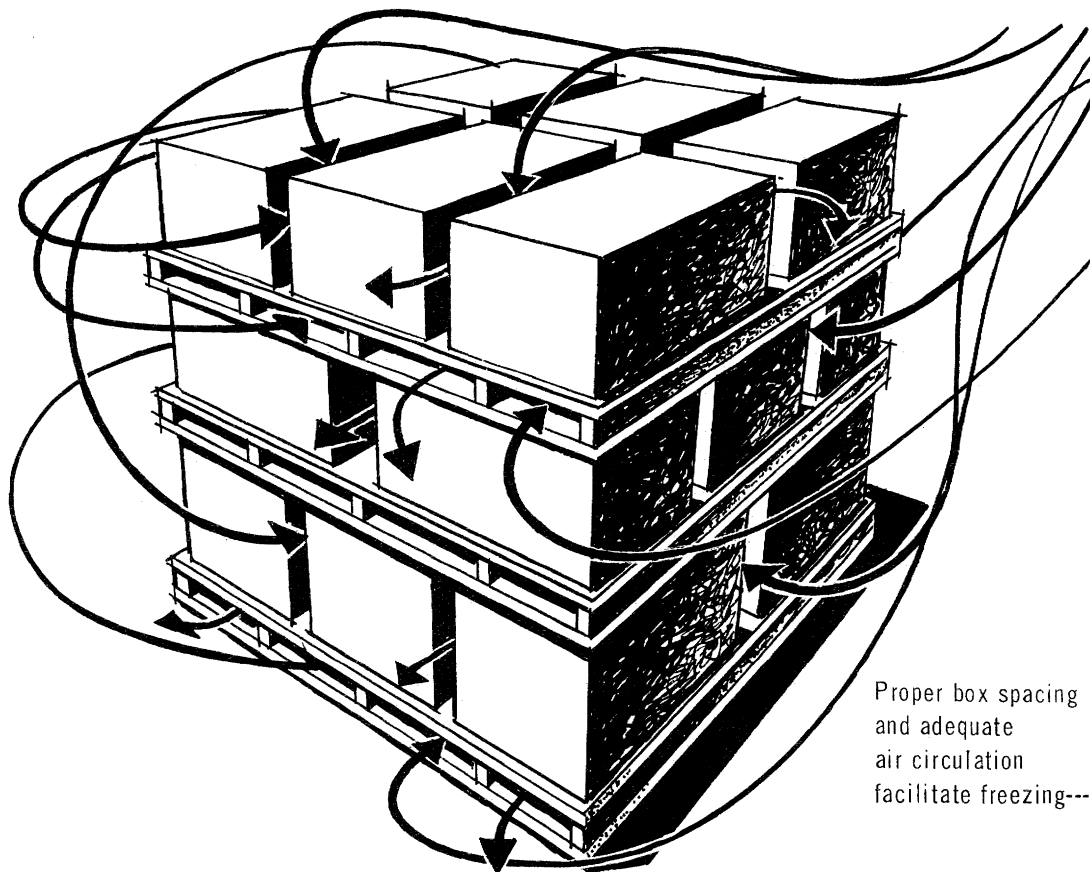
Freezing

1. REDUCE INTERNAL TEMPERATURES OF MEAT OR MEAT BYPRODUCTS TO 0° F. OR LOWER WITHIN 72 HOURS AFTER PLACING THEM IN A FREEZER.

A temperature of 0° F. or lower is necessary to prevent growth of putrefactive bacteria. The growth of spoilage-producing bacteria is practically nil at temperatures lower than 14° F. Internal temperatures may be periodically checked by drilling a small hole into the center of frozen product (a stainless steel spike or a hand drill equipped with a stainless steel bit should be used) and inserting a

thermometer into the hole. This technique will not damage product if the instruments used are sanitary.





Proper box spacing
and adequate
air circulation
facilitate freezing---

2. FOR "HOT PACKING" OF MEAT OR MEAT BYPRODUCTS, HAVE A FREEZER THAT IS CAPABLE OF REACHING AND MAINTAINING A TEMPERATURE OF -5°F. OR LOWER WITH FORCED AIR CIRCULATION WITHIN THE FREEZER. RECOMMENDED AIR VELOCITIES ARE 500 TO 1,000 FEET PER MINUTE.

The internal temperature of "hot pack" byproducts must be rapidly lowered if spoilage is to be prevented. Forced air (blast) circulation is necessary to properly freeze "hot pack" product that has been packed in bulk. Lack of adequate forced air circulation may cause spoilage even though freezer temperatures are kept at -5°F. or lower. Boxed product will eventually freeze without air circulation, but usually spoilage has already taken place.

3. MAINTAIN PROPER SPACING OF

BOXED MEAT OR MEAT BYPRODUCTS AS THEY ARE PLACED IN THE FREEZER. SUCH SPACING IS NECESSARY BETWEEN LAYERS OF BOXES AND BETWEEN BOXES IN THE INDIVIDUAL LAYERS.

Adequate air circulation is needed to quickly lower product temperatures. Improper spacing will result in impaired air circulation, and freezing time will be increased by many hours. Stacking of boxed product without proper spacing will actually insulate the interior of the stack and retard the freezing process. Boxed product in the middle of such a stack will spoil before freezing.

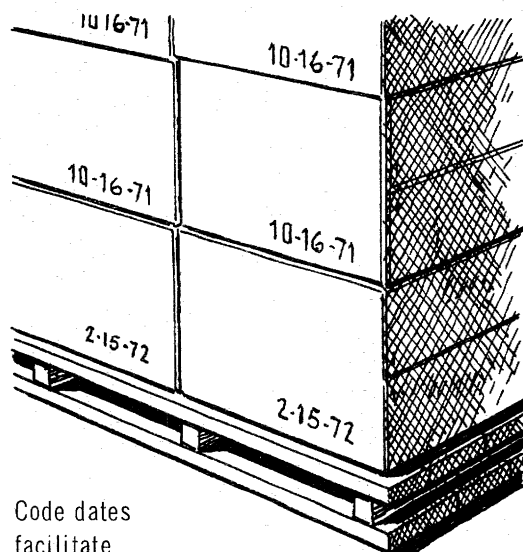
4. DO NOT REMOVE SPACERS OR RE-STACK PRODUCT IN HOLDING FREEZERS UNTIL INTERNAL PRODUCT TEMPERATURE HAS REACHED 0°F. OR LOWER.

Packaging

1. MAKE SURE MEAT OR MEAT BY-PRODUCTS LABELED AND SHIPPED AS FROZEN PRODUCTS HAVE AN INTERNAL TEMPERATURE OF 0° F. OR LOWER.

A product may appear to be frozen when actually it is frozen only on the outside. The internal core may still be several degrees above freezing. Such product could spoil in transit if the temperature within the carrier is higher than the temperature of the product. Thawing or partial thawing results in rapid bacterial growth that could cause products to spoil in transit. Putrefactive bacteria grow at temperatures above 14° F., so an internal temperature of 0° F. provides a margin of safety in the handling and transportation of frozen products.

2. MARK MEAT AND MEAT BYPRODUCT CONTAINERS WITH THE DATE THE PRODUCT WAS PACKED. A CONVENIENT AND EASILY SEEN PLACE FOR THE DATE IS CLOSE TO THE OFFICIAL ESTABLISHMENT NUMBER.



Code dates
facilitate
stock rotation---

The shelf life of meat and meat byproducts is shortened unless stored at 0° F. or lower. Meat byproduct shelf life varies from 2 to 6 months, depending upon the particular product. The average frozen shelf life of meat is 6 to 9 months, depending upon the species. This requires a relatively quick product "turnover." The date-of-pack marking on product containers enables packing plant management to easily determine which product is the oldest so it can be shipped first. Also, a packing date aids inspectors of USDA's Consumer and Marketing Service in determining the need and/or extent of a sampling reinspection on frozen products about to be shipped. Products bearing a recent date would ordinarily need less sampling than those bearing an older date.

3. KEEP THE EXTERIOR OF BOXES CONTAINING MEAT OR MEAT BYPRODUCTS FREE OF BLOOD OR OTHER SOILING AGENTS.

Such unsanitary and unsightly soilage is often caused by the overfilling of boxes and by blood soaking through boxes that do not have moisture resistant coatings.

4. USE POLYETHYLENE, HEAVY WAXED PAPER OR SIMILAR LINERS IN BOXES LACKING A WAX OR PLASTIC COATING ON THE INTERIOR SURFACE.

5. STORE UNASSEMBLED BOXES INTENDED FOR USE IN PACKING MEAT AND MEAT BYPRODUCTS IN CLEAN, DRY STORAGE AREAS. KEEP THE STORAGE ROOM TIGHTLY CLOSED AND FREE FROM MOISTURE, DUST, INSECTS, AND RODENTS.

6. USE BOXES THAT DO NOT EXCEED 6 INCHES IN DEPTH FOR PACKAGING MEAT AND MEAT BYPRODUCTS.

Gross boxed product weight, box length or box width are not as important in the time-temperature freezing relationship as is the depth of the box.

GUIDELINES for CARCASS MEATS



Chilling

1. CHILL CARCASSES THOROUGHLY, TO AN INTERNAL ROUND TEMPERATURE OF 40° F., BEFORE SHIPPING.

The proper chilling of carcasses is particularly necessary when such carcasses are to be in transit for 2 or more days. Refrigerated conveyances are not designed to lower product temperature. They are designed to **maintain** the temperature of loaded product. Improperly chilled carcasses, tightly loaded in a railcar or trailer, can become "off condition" even when refrigeration equipment functions properly.

2. SPACE CARCASSES IN CHILL COOLER (DRIP COOLER). ALLOW SUFFICIENT SPACE BETWEEN CARCASSES FOR AIR CIRCULATION.

Adequate air circulation is necessary

for proper carcass chilling. This is especially true for heavy beef carcasses. Enough space should be left between each carcass half to allow the chilled air flow to reach all carcass surfaces. Inadequate air circulation during the chilling cycle could result in sour rounds and/or "off condition" during transit.

Packaging and Shipping

WRAP CARCASSES OR QUARTERS WITH CLOTH, PAPER, OR OTHER SUITABLE COVERING BEFORE SHIPPING.

Covering the carcass product prior to shipment can greatly reduce the shipping contamination. A protective covering prevents rail dust, rust, grease, and other contaminants from reaching the carcass surface. Its use also reduces bacterial and other contamination that can occur and spread each time the carcass meat is handled by human hands between the slaughter plant and ultimate user.